



PERFORMANCE WORK STATEMENT (PWS)

NATIONAL GROUND INTELLIGENCE CENTER (NGIC) MODELING AND SIMULATION SUPPORT

Revision 1 - February 14, 2017

Revision 2 - July 18, 2017

Revision 3 - July 20, 2018

1.0 INTRODUCTION AND BACKGROUND

This is a Performance Work Statement (PWS) for support to the National Ground Intelligence Center (NGIC) Modeling and Simulation, which includes the Threat Modeling and Analysis Program (TMAP), Army Joint Research Analysis and Assessment Center (AJRAAC), Integrated Threat Analysis Simulation Environment (ITASE) and related software analysis activities. Successful task order performance in this work requires a capable workforce with robust experience and capability in: software modeling at a variety of fidelity levels; complex, multi-entity, real-time simulation; programming; software analysis; electrical, mechanical, and aerospace engineering; computer hardware; information technology; and technical documentation.

1.1 Threat Modeling and Analysis Program (TMAP)

The TMAP was developed by the Intelligence Production Centers (IPC) working collectively to address shortfalls in the analytical process that supports the production of scientific and technical intelligence. The TMAP implementation plan, collectively developed and approved by the US IPCs, calls for each participating IPC to develop and implement its own TMAP program.

TMAP is a standardized methodology for performing threat system analysis and for capturing analytical results in a common format that can be easily maintained, shared among analysts, and can support conversion into customer-specific simulations or database formats. The TMAP effort uses commercial off the shelf (COTS) software for efficient usability in the IPC analytic processes.

1.1.1 Software

The modeling and simulation default language for the TMAP program is the commercially available product family, Matlab and Simulink, from Mathworks. In some cases, other languages may be used with Government approval. This designation ensures software interoperability between TMAP member organizations. Mathworks products allow developers to generate source code, which allows developers to support multiple simulation languages and architectures with developed model contents. Organizations participating in TMAP are discouraged from using Mathworks toolboxes and blocksets. Instead, they are encouraged to create Government-owned, reusable blocks to ensure interoperability. In development cases where developers are creating low level code or reusing code, TMAP developers can use Simulink's capability to import code

from traditional programming languages into Simulink. Periodically, the version of Matlab and Simulink will be uplifted as directed by TMAP member organizations.

1.1.2 Collaboration and Sharing

TMAP member organizations are encouraged to collaborate and exchange intelligence and resultant threat system models. Additionally, member organizations discuss new mission requirements, and identify assumptions, limitations, and the intended use of new models. Member organizations also provide feedback on a model during its lifecycle.

1.1.3 Reuse

Model reuse is a primary tenet of TMAP, spanning from low-level math blocks to entire system models. Contributions to TMAP models are Government-owned intellectual property. Through reuse, TMAP partners can focus on new developments instead of reformatting old code or duplicating efforts. Reuse also encourages increased timeliness of intelligence results and a pedigree of authoritative intelligence.

1.2 Army Joint Research Analysis and Assessment Center (AJRAAC) and the Integrated Threat Analysis Simulation Environment (ITASE)

The AJRAAC is a hardware lab, which hosts constructive simulations based on weapon system and C4ISR models. Models integrated into the simulation environment include both TMAP and other high fidelity models. ITASE is hosted in the AJRAAC, and provides the software backbone to allow multiple system-based models to interact with each other and the surrounding (simulated) environment. In some cases, ITASE/AJRAAC may also be integrated with simulations and system models provided or hosted by other entities.

1.3 Goals

The key goals of Modeling & Simulation (M&S) within the Intelligence Community (IC) are: (1) the development of tools that are used to analyze raw intelligence data; (2) the development of analytic tools that can be used to generate results that can satisfy many routine data requests through predictive analysis; (3) supplementing and complementing existing threat system performance databases; (4) helping meet customers' modeling and simulation needs.

1.4 Partners

The following organizations are participating in the TMAP:

<u>ACRONYM</u>	<u>NAME</u>	<u>LOCATION</u>
NGIC	National Ground Intelligence Center	Charlottesville, VA
MSIC	Missile and Space Intelligence Center	Redstone Arsenal, AL
NASIC	National Air and Space Intelligence Center	Wright Patterson AFB, OH
ONI	Office of Naval Intelligence	Suitland, MD

Completion of tasking in this task order will require frequent interface and collaboration with representatives from these organizations. While these are the primary partners, there are other team members. Interactions may take the form of model architecture design collaboration, interface discussions, joint model development, model/simulation integration, and generation of joint analysis data.

2.0 OBJECTIVE

The NGIC has the mission to assess the capabilities, intentions, technologies, and weapons and systems of current and future foreign ground forces. This is conducted in support of US acquisition, operational, and policy-making customers. Customers are both internal and external to NGIC, and have a need for modeling products related to foreign ground force weapon and C4ISR systems (examples include radars, electro-optical systems, tanks, artillery, helicopters, transports, mines, ammunition, rockets, tactical unmanned aerial vehicles, counter-C4ISR, communications equipment, RF sensors, directed energy systems) and system components/aspects for which NGIC is responsible. This task order provides external assistance to apply Modeling and Simulation (M&S) tools and techniques in accomplishing this important mission.

3.0 SCOPE

The scope of work for this task order falls into the following categories:

- 1) **EXISTING MODELS SUPPORT.** Ongoing maintenance and simulation environment administration of existing foreign threat system models, including the following tasks:
 - Maintenance of Software-Based models
 - IT Interaction/Administration at Various Classification levels, and meeting of associated DOD regulations.
 - Creating versions of models at different releasability and classification levels
- 2) **SIMULATION SUPPORT.** Incorporate existing and new-development models into complex real-time battlefield simulations using realistic data. Extensive and well-planned testing will be required to validate and verify performance. Use simulations to create visualizations and intelligence data. Additionally, administer the hardware and software in the laboratory used for simulations. These simulations are performed on a standalone classified network. This task area includes the following tasks:
 - Simulation Environment Administration – Including Both Local and Distributed Simulations
 - Simulation Environment Operation/Tool Development
- 3) **NEW MODELS SUPPORT.** Design, production, and testing of new foreign threat models, to be used as an intelligence baseline for defining threat systems. Model development will be based on Government provided data, and contractor assisted solid physics/engineering judgment. The Government anticipates approximately 6 models during the Base Period and approximately 6 models during each Option Period. The Government anticipates that on a post-award basis, the number of models during the base and each option period may vary based on evolving needs of NGIC.

For new model and original analysis support, specific direction will be provided via a Technical Direction Letter (TDL) as defined in PWS Section 4.3. Modeling will follow the explicit methodology in PWS Section 4 below. Contractor may also be required to provide detailed analysis and modification of existing software, which will be provided by the Government. Skills required for this will include various computer science related disciplines, and experience associated with applying scientific methods to predicting software functionality/performance.

- 4) **REMOTE SITE SUPPORT.** Support the integration of NGIC models and simulations at organizations and agencies that cooperate with NGIC to meet Government requirements.

- 5) **PROGRAM MANAGEMENT AND ADMINISTRATION.** Provide ongoing program management and administration for the duration of the task order. Tasks include overall program management, Weekly Status Meetings (WSM), Monthly Status Reports (MSR), trip reports, and In-Progress Reviews (IPRs).

6) **OPTIONAL TASKS**

- **OPTIONAL TASK 1 - SURGE CAPABILITY** - support for unforeseen, ad hoc requirements or unplanned increases in workload that may arise under the scope of this PWS.
- **OPTIONAL TASK 2 – NEW MODEL SUPPORT CAPABILITY** – support for new models above the estimated six (6) estimated under PWS Section 4.3
- **OPTIONAL TASK 3 - EXISTING SOFTWARE ANALYSIS SUPPORT.** Analyze existing Government-supplied software of various code-languages and architectures. Contractor shall develop documentation and modify the software for future use in models.
- **OPTIONAL TASK 4 - TRANSITION-OUT SUPPORT** - At the completion of this task order, the contractor shall support transition of all development products, artifacts, software and tools, which were funded under this task order, to the Government.

4.0 TASKS

For each task identified below, the contractor shall provide local management to coordinate tasking and assignments of on and off-site employees. The contractor shall ensure project interdependencies are planned and risks adequately mitigated. The contractor shall be responsible for tasking of employees, prioritization of their time, adherence to the terms of the PWS, and adherence to Government mandated training and procedures. Completion of tasks will require a mix of NGIC-located and contractor-located contractor personnel of various disciplines and skill levels.

4.1 Existing Models Support

The contractor shall provide local support to address existing model issues. Major issues will be prioritized in NGIC's tracking system. At the weekly COR meeting, NGIC COR will communicate prioritization of known existing model support issues to the contractor. The contractor shall work with Government users and on-site IT technicians to determine the best methods to resolve incompatibilities and adjust interfaces to provide updated results. The contractor shall provide a summary of the details to the Government, including required Government Furnished Equipment (GFE), Government Furnished Information (GFI), and access to hardware/software, at least 14 days before information/access is needed. Contractor shall execute modification of existing models, conduct testing to ensure expected results/performance, and document changes in software code through the use of code comments, user manual, and analyst manual.

As required, the contractor shall alter existing models to change the classification and releasability levels of the models. Additionally, perform this task for models in development when necessary.

At least one contractor employee shall be trained to be a data transfer agent (DTA) by NGIC to move models between networks. This contractor shall move the models between networks as necessary.

4.2 Simulation Support

4.2.1 Simulation Environment Administration

AJRAAC/ITASE Operation. The AJRAAC is a stand-alone, networked multi-computer facility established on-site at NGIC to accomplish M&S activities that cannot run on standard desktop computers. This network is also linked with similar systems at other geographically dispersed locations. Because this network is a standalone network, the contractor will be tasked with many of the administrative services for the network. In cases where NGIC enterprise services is responsible for the network administration, the contractor shall be tasked with coordination. The contractor shall provide on-site support to:

- Maintain and administer AJRAAC hardware and operating software in compliance with NGIC and DoD-approved software versions, hardware/software configurations, and ITASE Architecture.
- Configuration manage AJRAAC hardware, simulation software, and models in accordance with existing procedures.
- Provide expertise to maintain AJRAAC hardware and ITASE software to ensure an operating real-time environment. In parallel, all hardware and software configurations must meet DOD security requirements.
- Integrate Government provided software and models into the AJRAAC facility and/or ITASE simulation architecture, execute threat system engagement scenario simulations developed in collaboration with NGIC analysts, and capture output in a format directed by the Government for later viewing and analysis by the analyst(s). The output format may change depending on the particular scenario, simulation run, or intended end-use of the product.
- Create, streamline, and maintain Standard Operating Procedures (SOP) for common AJRAAC tasks as directed by the Government.

4.2.2 Simulation Environment Operation/Tool Development

Operate local simulation environment for the purposes of creating scenarios and studies to fulfill NGIC requirements. This requires incorporating models operating in the environment into realistic real-time simulations of scenarios with feasible parameters. Support creation of realistic simulations that provide battlefield visualizations and both raw and processed intelligence data. Additionally, identify and report recommendations for tools or enhancements to improve quality and efficiency of the simulation environment.

Conduct studies to provide Government-specified simulation output for assessments. These studies include stand-alone, one-on-one, few-on-few and integrated battlefield-level many-on-many studies. Studies support the Combatant Commanders (COCOMs), Acquisition Commands, or intelligence threat assessments. Models and simulations used in the studies shall include models of a variety of fidelities, and may be running in stand-alone or distributed configurations. Results of simulation-based studies shall be provided to customers as simple electronically formatted data, or as more sophisticated displays.

To initiate complex studies anticipated to require more than 160 hours of contractor effort, the Government will issue a **Technical Direction Letter** (TDL), via email, that defines the project scope, objectives, desired outcomes, and timeframes for completion of the work. The contractor shall be responsible for tasking of employees to follow the Technical Direction Letter (TDL).

Within 10 business days after receipt of the TDL, the Contractor shall create and submit a written Project Plan defining the approach to the work defined in the TDL. The Contractor's Project Plan shall detail:

- Methods to be used to complete the work.
- Tasks and activities to be undertaken to complete the work consistent with the scope of the Government's TDL.
- A Spend Plan showing specific resources to be used and effort to be applied to the work on the basis of the labor mix established in the Contractor's original price proposal.
- Schedule and milestones for completing the work in required timeframes.
- Quality assurance, risk management, configuration management, and security management plans.
- Deliverables to be produced with corresponding due dates listed on the Schedule.
- Reporting methods for communicating project status and progress information to stakeholders shall be incorporated into the Monthly Status Report described below.

Note: The Government anticipates studies that will be large enough to require a TDL. TDL will not explicitly require a study phase or requirements document. This is different than the study phase for new models.

4.3 New Models

To initiate performance on a model, the Government will issue a **Technical Direction Letter** (TDL), via email, that defines the project scope, objectives, desired outcomes, and timeframes for completion of the work. The contractor shall be responsible for tasking of employees to follow the Technical Direction Letter (TDL).

After receipt of the TDL, the contractor shall issue a letter within 10 business days to GSA indicating receipt of the TDL, acceptance of the TDL, and the initiation of the Study Phase (Phase 1 in **Section 4.3.1** below) of the project. The specifics for each Study Phase will be detailed in the TDL. Upon completion of the study phase, a system requirements review shall be held, which includes slides describing a project plan, schedule, and detailed requirements spreadsheet. The detailed requirements spreadsheet shall be delivered to both GSA and NGIC via email. NGIC will make all necessary modifications to the requirements spreadsheet and will submit the necessary changes to both GSA and the Contractor within 10 business days of the system requirements review.

Within 10 business days after government acceptance of the modified requirements spreadsheet, the Contractor shall create and submit a written Project Plan defining the approach to the work defined in the TDL and government-accepted requirements spreadsheet. The Contractor's Project Plan shall detail:

- Methods to be used to complete the work.
- Tasks and activities to be undertaken to complete the work consistent with the scope of the Government's TDL.
- A Spend Plan showing specific resources to be used and effort to be applied to the work on the basis of the labor mix established in the Contractor's original price proposal.
- Schedule and milestones for completing the work in required timeframes.
- Quality assurance, risk management, configuration management, and security management plans.
- Deliverables to be produced with corresponding due dates listed on the Schedule.
- Reporting methods for communicating project status and progress information to stakeholders shall be incorporated into the Monthly Status Report described below.

The Contractor shall submit a Draft Project Plan to NGIC COR for review and shall incorporate changes to the plan based on NGIC comments. The Contractor shall not proceed with performance until NGIC has reviewed and approved of the Final Project Plan. If necessary, the Government will issue an

amendment to the TDL and contractor shall revise their project and spend plan for review and approval. The Contractor shall not proceed with performance until NGIC has reviewed and approved of the Final Project Plan, and the Contracting Officer has provided authorization to proceed via task order modification. The GSA CO will issue an Action Memo to incorporate the approved Project Plan into the task order.

Reporting methods for communicating project status and progress information to stakeholders shall be incorporated into the Monthly Status Report per described below.

4.3.1 Model Methodology

Model development shall follow a structured approach, and shall more specifically follow TMAP modeling guidelines. Documents further describing TMAP modeling include the NGIC M&S Development Process Document, NGIC TMAP Standards, NGIC TMAP Documentation Guidelines, and TMAP Annex 1-C. Each task shall be conducted in a phased approach to facilitate scheduling and oversight and to minimize risk. The contractor shall keep the Government updated on at least a monthly basis by email if any discovered Government Furnished Information which will be required. The phases are as follows:

Phase 1: Study. This phase includes problem domain definition and identification of requirements and any risks associated with completing the task. At the kick-off of this phase, the contractor shall begin a study, working toward a system requirements review. The contractor shall present the results of the study in a formal system requirements review (SRR) that describes the problem domain; the design; overall function and performance requirements for each individual model; opportunities in the current effort to reuse existing TMAP model components; a plan and schedule for execution of the Design phase, and identified risks along with mitigation plans. The system requirements review shall be presented as a verbal report with Powerpoint slides. The contractor shall provide to GSA and NGIC a formal requirements document in the form of a requirements spreadsheet at least 24 hours before the system requirements review. Reusable model components developed into toolboxes and libraries shall be indicated as a requirement in the requirements spreadsheet. During this phase, the contractor shall also create the first version of the architecture description document. Within 10 days of the SRR, the government will modify the requirements spreadsheet and submit the modified version to the contractor and the GSA. The contractor shall submit a project plan and price estimate for the remainder of the project to NGIC and GSA within 10 business days of receipt of the modified requirements spreadsheet based on this approved requirements spreadsheet.

Phase 2: Component Design Plan and Test Plan. This phase includes detailed planning of the model design or modification; identification and design of external interfaces (if any); data input and output mechanisms; and graphical user interfaces (GUI). The contractor shall define the architecture, components, interfaces (internal and external), data input and analytic output mechanisms, and functionality required to satisfy the requirements identified in the approved Requirements Document. Design will support major functional components being developed as stand-alone library components and housed in an architecture that supports unit testing and the co-location of documentation. The contractor shall ensure that the model design is object-oriented and compatible with the NGIC TMAP Weapon System Modeling Framework, the NGIC TMAP Weapon System Model Architecture, and NGIC model design and style guidelines, unless otherwise directed by the Government. The contractor shall also develop a test plan, which leverages a modular/component-level approach to development and testing, identifies necessary government furnished data, and includes a plan for ITASE integration. Each model should be divided into logical and reusable components which will be developed, tested, and documented independently. During this phase, the contractor shall create the second version of the

architecture description document. The Government will then approve or recommend modifications. Results of this phase shall be presented to the government during a preliminary design review (PDR) to ensure the design meets all requirements. The PDR shall consist of a verbal report with Powerpoint slides.

Phase 3: Implementation and Test. This phase includes implementation of the design and production of the model. The contractor shall implement the models in accordance with the approved design plan, quality control/test plan, and present interim models or draft reports and test reports as specified in the Work Plan. Component testing will fully exercise all library sub-components and the contractor shall integrate the unit tested library components into a functional model, while following the design specified under Phase 2. The contractor shall configuration manage each model during implementation. The contractor shall maintain a model problem report system to address problems found during NGIC review and testing of interim model deliverables. Progress, issues, and explanations and recommended courses of action for correcting errors deemed significant by either the Contractor or the Government shall be presented at in-progress reviews (IPR). The contractor shall correct errors or deficiencies in accordance with agreed-to courses of action. During this phase, the contractor shall present current design details to the government in a critical design review (CDR). The CDR shall consist of a verbal report with Powerpoint slides. While not all major subcomponents need to be implemented during this phase, details on the plans of the implementations should be included in the CDR.

Phase 4: Final Documentation and Integration Test. This phase prepares and presents the test readiness review (TRR), and performs all necessary tests on the TMAP model. The contractor shall present a test description document (TDD) describing specific test details, but without test result data and information included, to the government at least 24 hours prior to the TRR. The test description document indicates all specific tests to be performed on the model, including test scenarios, conditions and inputs. Upon receipt of the TDD without test results, the government shall have 14 calendar days to approve the detailed tests provided in the TDD. The contractor shall conduct independent, internal testing of models, fully exercising all model components and all model levels. At the completion of this phase, the contractor shall document test results in an updated test description document.

Phase 5: TMAP Model Delivery. The contractor shall deliver the finished product together with the following documentation: installation instructions, user manual (providing instruction to the average user on how to operate the model), and an analyst manual (documenting all critical algorithms, assumptions, and classification/sourcing for parameters. The contractor shall document the finished product in accordance with NGIC TMAP Model Documentation Guidelines, unless otherwise directed by the Government.

Phase 6: Delivery into a Real-Time Simulation Environment: In this phase, create a version of the code that will work in a real-time simulation environment, specifically ITASE. Use commercial off the shelf packages, such as Mathworks' Simulink Coder, to deliver a real-time version of the model, and write additional software wrapper to allow the model to run in a real-time environment. Unless otherwise directed, all models delivered under this task order shall be delivered to the Government, integrated into ITASE and functioning no slower than real-time. Key to achieving this requirement is a methodical and forward-looking approach to model design decisions, and efficient software wrapper design.

Phase 7: Real-Time Testing: In this phase, test the ITASE-compatible model in a real time environment. Similar to phase 4, the contractor shall conduct testing of models, fully exercising

all model components and all model levels. At the initiation of this phase, the contractor shall prepare a detailed ITASE test plan specifying test scenarios, conditions and inputs. At the completion of this phase, the contractor shall prepare a test report documenting test results.

4.3.2 Models Developed Under this Task Order

For each new model identified under this task order, the Government will issue a **Technical Direction Letter** (TDL) that defines the specific tasks for the identified model.

The following requirements are necessary for all NGIC models.

Top-Level Requirements

- The contractor shall design and implement threat system models, weapon system component models and weapon system engagement models (e.g., one-on-one to many-on-many) to be compatible with existing threat system modeling methods. The contractor shall, using mathematical equations, transform physical operating principles into software models representing components of, or entire weapons systems for the range of foreign ground force threat systems (e.g., radars, air defense artillery, battlefield electronics, close combat, maneuver support, mines, field artillery, tactical aviation, sensors) in NGIC's area of responsibility. Ultimately, develop a representation of the system for characteristic and performance (C&P). The model shall be classified and delivered no higher than the intelligence data requires.
- Model shall be created using Matlab/Simulink version 2016b, unless directed otherwise by the Government, and shall avoid non-standard toolboxes or add-on software packages. Exact version is subject to change when NGIC and TMAP partner organizations update versions. Other software packages may be directed by Government depending on application.
- Leverage existing Threat Modeling Analysis Program (TMAP) models of NGIC, MSIC, NASIC, and ONI in order to increase re-use, commonality, consistency of architecture, and to ensure responsible expenditure of Government funds.

Administrative Requirements

- Provide to COR a work schedule that includes all primary technical tasks. Any deviation from this schedule by more than 10% shall be reported to COR. Government and contractor will work together to determine best course of action.
- Contractor shall provide in-person In Process Reviews (IPR) to coincide with 7 major phases of the project or other project milestones, if determined necessary by the COR

Each IPR shall include:

- Verbal description of the work completed on the model
- Demonstrations, as available, of completed model components or tests.
- Demonstrate current status of software implementations.
- Updated status on the current model challenges and risks.
- Update on current task schedule. Overlay of planned task schedule (including subtasks) vs. actual execution schedule, calling attention to any impacts to overall delivery deadline.

Documentation Requirements

Contractor shall produce a complete documentation package for the model, which should follow NGIC's established format. Documents include:

- User's Manual, enabling an inexperienced operator to properly install the model, verify proper installation, run the model, and generate results.
 - Architecture Description Document, giving a high level overview of the model's basic structure
 - Analyst Manual, enabling experienced system analyst to understand the inner-workings of the model, the critical algorithms which dictate performance, the assumptions made during design, and capabilities/limitations of model performance relative to tactical system.
 - Test Documentation, to be referred to as the TMAP Verification and Validation Report (TVVR). This should document the expected and observed performance of each component of the model, when subjected to test routines to be defined by contractor (with Government approval) during the design phase. The TVVR is composed of the test plan, described in phase 2 in model methodology, and the Test Description Document, described in phase 4 of the model methodology. After completion of the tests, results will be included in this (TDD) document.
 - ITASE Test Plan and results, indicating the test approach for the model. ITASE testing shall follow the ITASE Verification and Validation Plan. Test Plan shall specify test scenarios, conditions and inputs for the ITASE-compatible model.
 - Traceability and source of all classified data and performance characteristic assumptions in the model. These should be called out in code-level commenting of model and also be collated at a high level in analyst manual to ensure all data is easily discoverable in one location.
 - The contractor shall document any known instances when information available is insufficient to represent system capability with high confidence. Additionally, any system features or operations not able to be implemented within the scope of this PWS shall be reported to the Government. The Government will work with the contractors to decide the appropriate course of action.
- At the completion of test phase, the contractor shall prepare a test report documenting test results.
- Prepare a manual to document the use and capabilities of the real-time version of the model.

Additional Model Technical Requirements

- Model shall operate in Windows 7 environment in 64 bit mode. Operating system is subject to change based on NGIC and TMAP partner requirements.
- Operator displays and controls shall not require 3rd party applications or additional Matlab tool boxes. To greatest extent practical displays and controls should be consistent among models.
- Compiled version shall operate on a standard desktop Windows 7 machine without non-standard add-on applications, and shall seamlessly accept user parameters, execute, generate data, and display/export results via a single set of user Graphical User Interfaces (GUI). This operation should require no additional 3rd party software.
- Compiled version shall operate no slower than real-time on a standard desktop Windows 7 machine.
- If necessary, model shall be configured with a blockset to handle model variants.
- Model parameters shall be reconfigurable without re-compiling the model.
- Build out the threat system device interfaces.
- Final delivery of model shall include all test scripts and test files.

- Follow NGIC standard operating procedures for version control.
- Follow NGIC standard operating procedures for TMAP model folder structures.

ITASE Requirements

- Model interfaces shall conform to ITASE Interface Control Document.
- Use commercial off the shelf packages, such as Mathworks' Simulink Coder and write additional software to allow the model to run in a real-time environment. Deliver a real-time version of the model compatible with ITASE.
- Test the ITASE-compatible model in a real time environment, fully exercising all model components and all model levels.
- Model shall be delivered with all components detailed in the ITASE Handoff Checklist, as well as all test scripts and test files.

4.3.3 Model Verification and Validation

Contractor shall verify that model performs as documented in the design process and validate that each library sub-component and subsequent model accurately reflects the current operation of the actual system to the best understanding of Government. Sub-systems will be unit tested in order to ensure that they function as designed. A suite or matrix of test to fully explore possible operational scenarios and the resulting performance of the model under test shall be conducted by the contractor. Results shall be reported and analyzed by the contractor. Discrepancies shall be addressed. All testing shall be reported in a combination of test report and test description documents. Testing and verification and validation shall follow the standards in TMAP Annex1-C1 and shall follow the ITASE Verification and Validation Plan. An electronic version of the model configuration, test matrices and results and shall be delivered as a baseline for configuration management.

4.4 Remote-Site Support

Support the integration of models and simulations of NGIC models at organizations and agencies that cooperate with NGIC to meet Government requirements. This may include support for the following:

- Required meetings, including internal progress reviews
- Debugging of delivered and in-progress models
- Providing and maintaining expertise to host a real-time simulation environment

4.5 Program Management and Administration

4.5.1 Program Management Support

The Contractor shall provide the necessary program management, technical and functional services necessary to plan, manage, and control performance under this Performance Work Statement (PWS). The Contractor shall provide ancillary administrative, clerical, documentation and reporting services to manage performance under this Task Order.

4.5.2 Kick-Off Meeting

The Contractor shall participate in a Kick-Off Meeting at a place and time approved by the Government. The meeting will provide an introduction between the contractor personnel and Government personnel initiate performance and to discuss the overall management, administration, technical services and processes and procedures (e.g. travel/ODC authorizations, invoicing, security, etc.). Attendees are expected to include contractor personnel and Government staff from NGIC and GSA.

4.5.3 Weekly Status Meetings (WSM)

Informal weekly discussions with COR and other NGIC representatives to highlight near-term progress, risks, concerns, and project interdependencies. A high priority will be placed on working with the Government to resolve issues early, and before they cause impacts.

4.5.4 Monthly Status Report (MSR)

The Contractor shall provide written Monthly Status Reports (MSR) to track project status, issues, and progress. Monthly reports are due by the 15th calendar day of each month throughout the life of the task order. The contractor shall establish quality assurance, risk management, configuration management, and security management plans for each new model and report status in the MSR. The Contractor shall electronically submit the MSR to the GSA COR, NGIC Project Manager (PM) and NGIC POC each month prior to submitting the invoice. The Contractor shall include, at a minimum, the following information in the status report:

- Overall schedule of activities for entire task order
- Overall status of services and progress, including financial status (hours, personnel, and costs against CLINs/tasks).
- All reports of financial status and charges shall clearly map to Contractor project plans, spend plans, and invoices.
- Status of taskings.
- Major elements of progress achieved to date.
- Progress achieved since the last report.
- Planned support activities and the current status of all projects/products/working papers, including planned delivery dates and actual delivery dates. Any variation between the planned and actual delivery dates from the dates in approved project plans shall be clearly noted in the MSR.
- Resource expenditures, showing both planned and actuals from task kick-off
- By-person accounting of expended hours, showing hours worked by labor category and individual contractor during the reporting period.
- A graphic with spreadsheet data showing predicted and actual running monthly expenditures over the period of the task, reported by CLIN/sub-CLIN levels.
- Updated listing of planned GFE and GFI and associated need-dates.
- Potential Risk Areas and Risk Events: Identification of any risk areas or events, outstanding issues or any occurrence that may impact cost, schedule, or performance and recommendations as to their resolution concerning the problems submitted during the interim, plus any corrective action that was taken(or should be taken) to correct identified risks.
- Problems remaining and proposed solutions.
- Significant problems encountered and solutions developed during the period
- Proposed recommendations for improvements/enhancements to service, technical capabilities, management procedures, etc.
- Adjunct reports such as activity reports, technical reports and logs, shall be supplied as supplements.
- Activities planned for the next reporting period.
- Signature spaces for the NGIC point of contact (POC) and the Contractor.

4.5.5 Trip Reports

The Contractor shall provide a Trip Report for each trip that the Government requires them to travel outside the local area. The report shall contain at a minimum the following:

- Dates of travel
- Persons traveling

- Purpose of travel
- Expenses associated with travel
- Supporting Documentation
- Results
- Action items
- List of anticipated required follow-up engagements

4.6 OPTIONAL TASKS

The options described below will be invoked through award of a written task order modification issued by the GSA Contracting Officer (CO). Options may be invoked, in whole or in part, at the discretion and unilateral right of the Government.

4.6.1 OPTIONAL TASK 1: SURGE CAPABILITY

The Government reserves the unilateral right to exercise Optional Surge Capability to support unforeseen, ad hoc requirements or unplanned increases in workload that may arise under the scope of this PWS. Optional surge capability support will be invoked at the Government's discretion through a written task order modification issued by the GSA Contracting Officer. This optional work will be exercised on a cost plus fixed fee basis.

For pricing purposes, the Not-To-Exceed (NTE) ceiling amount established for this unburdened Optional Surge Capability in each year of performance is shown in the table below:

Base Year NTE	Option Year 1 NTE	Option Year 2 NTE	Option Year 3 NTE	Option Year 4 NTE
\$400,000.00	\$400,000.00	\$400,000.00	\$400,000.00	\$400,000.00

Optional positions are anticipated to include professional skillsets similar to the labor mix performing mandatory services under this Task Order.

The scope of this optional new model support capability will be specified in technical direction letters and may span requirements described in PWS Sections:

- 4.1 Existing Model Support
- 4.2 Simulation Support
- 4.4 Remote-Site Support
- 4.5 Program Management and Administration

Prior to awarding the modification, the Contracting Officer will provide the Contractor with a written request for surge capability specifying the unforeseen, ad hoc or unplanned increases in workload support required, the nature of work to be performed, deliverables, and required timeframes. The Contractor shall respond to this request in writing within five (5) business days with a quote showing the proposed staffing plan and notional schedule to meet the government's requirements. Generally, the Contractor shall have the capability to surge contractor staff to meet mission demands within 30 calendar days of the effective date of the modification; however there may be a need to begin a surge effort within a shorter response time. The Contractor shall manage workload surges effectively and in a manner that efficiently schedules and applies contractor resources to meet mission requirements and NGIC priorities. The Contractor shall

meet the surge capability requirements without decreasing the current support to, or quality of, any of the other NGIC requirements under this task order.

The Contractor shall coordinate with the Government to plan and adjust staffing schedules to support surge capability activities while concurrently delivering ongoing services, without degradation, for day-to-day operations under the scope of this PWS. This may include adjusting normal work schedules, backfilling positions, or minimizing/prohibiting leave of individual Contractor employees to achieve the required coverage.

4.6.2 OPTIONAL TASK 2: NEW MODEL SUPPORT CAPABILITY

Modeling and simulation among TMAP partners provides useful feedback for a variety of customers, including the acquisitions community, research community, and national-level decision makers. For this reason, modeling and simulation at the NGIC is partially funded by sources external to NGIC. Due to changing demands, requirements, budgets, and priorities, it is not possible to assess the demand for models to be built, models to be maintained, or simulation environment operation in future years.

As a result of the above, it is anticipated that NGIC may require additional new models to be developed in the base and each option year of this task order to be exercised as a unilateral right of the Government. As such, the Government reserves the unilateral right to exercise Optional New Model Support Capability, whereby NGIC requires services similar to the scope of PWS Section 4.3 if/when there is additional demand. This optional work will be exercised on a cost plus fixed fee basis.

For pricing purposes, the Not-To-Exceed (NTE) number of additional new models for this Optional New Model Support in each year of performance is shown in the table below:

Base Year Models NTE	Option Year 1 Models NTE	Option Year 2 Models NTE	Option Year 3 Models NTE	Option Year 4 Models NTE
4	6	8	10	12

Optional positions are anticipated to include professional skillsets similar to the labor mix performing mandatory services under this Task Order.

The scope of this optional new model support capability will be specified in technical direction letters and may span requirements described in PWS Sections:

- 4.3 New Models Support

At the time of exercising this optional support, the Contracting Officer will issue technical direction following the same procedures as outlined in PWS Section 4.3.

When optional work is exercised, the services rendered under this optional task shall be documented and reported in Monthly Status Reports (MSR) and progress updates, performance metrics, and status on such work shall be covered in Weekly Status Meetings/In Progress Reviews consistent with program management activities described in PWS Section 4.6.

4.6.3 OPTIONAL TASK 3: EXISTING SOFTWARE ANALYSIS.

The Government reserves the unilateral right to exercise Optional Existing Software Analysis to support NGIC's software analysis program. Optional Existing Software Analysis support will be invoked at the Government's discretion through a written task order modification issued by the GSA Contracting Officer. This optional work will be exercised on a cost plus fixed fee basis.

The following represent the needs of NGIC's software analysis program. The contractor shall provide the services specified below in accordance with applicable tasks identified below. Provide detailed assessments that cover the capabilities and limitations on the following topics. The contractor shall evaluate the available information and coordinate with the Government to reprioritize the assessments below. The list is not designed to be all encompassing but to provide general direction to the contractor.

- System Software Analysis. The contractor shall perform system software analysis on Government provided system software, document its key processes and algorithms, and describe processes and methodology for integrating the software, whole or in part, into threat system models, vulnerability analysis, and the AJRAAC. Software Analysis reports shall follow a defined format, to be provided by the Government.
- Consider hardware and software architecture intended for the analyzed software.
- Write detailed reports on algorithms and science/engineering for each portion of the provided software
- White paper that identifies improvements required to any existing TMAP model:
 - Whole components that can be lifted and integrated
 - Functions of the model that can be improved analytically
 - Impact to run-time and trade-space analysis
 - Estimated cost and time to complete
- The contractor shall co-populate existing analytic products previously provided to Government in previous related Task Order GSQ0315DS0041 with newly discovered information in order to expand upon the following information previously delivered.
- Updated Hierarchical and functional map of programs
- Updated Functional plot diagram (decision tree) of functions
- Updated List of variables, key data structures and description of each function of program
- Updated I/O memory map
- Update previously delivered analytical reports with new findings
- Updated database populated with technical comments and findings.

For pricing purposes, the Not-To-Exceed (NTE) ceiling amount established for this unburdened Optional New Model Support in each year of performance is shown in the table below:

Base Year NTE	Option Year 1 NTE	Option Year 2 NTE	Option Year 3 NTE	Option Year 4 NTE
\$650,000.00	\$650,000.00	\$650,000.00	\$650,000.00	\$650,000.00

The Government anticipates that this software analysis task will require **senior software forensics analyst** support. The Government does not anticipate this specialized skill will be required for the new models described under PWS Section 4.3.

At the time of exercising this optional support, the Contracting Officer will issue technical direction following the same procedures as outlined in PWS Section 4.3.

4.6.4 OPTIONAL TASK 4 – TRANSITION OUT SUPPORT

At the completion of this task order, the contractor shall support transition of all development products, artifacts, software and tools, which were funded under this task order, to the Government. A written plan shall be submitted by the contractor NLT sixty (90) days prior to the end of the task order, in accordance with delivery instructions provided by the Government. The transition-out plan shall be based on a maximum sixty (60) day period prior to the end of the task order. The Transition-Out Plan shall facilitate the accomplishment of a seamless transition from the incumbent to the incoming contractor/Government personnel at the expiration of this Task Order. The Contractor shall identify transition activities, schedules and milestones for turnover of work centers/functions and identify how it will coordinate with the incoming and or Government personnel to transfer knowledge regarding the following, as applicable:

- Project management processes.
- Points of contact.
- Location of technical and project management documentation.
- Status of ongoing technical initiatives.
- Transition of personnel.
- Establish and maintain effective communication with the incoming contractor/Government personnel for the period of the transition.
- Inventory, inspection and transfer of IT software and hardware, licenses, and warranties.
- Inventory, inspection and transfer of all contractor maintained classified data, equipment and devices, ensuring positive control, accountability, and chain of custody is maintained for all sensitive items.
- Technical artifacts and configuration baselines.
- Elevated system privileges, IAW technical direction issued by the COR.
- Operations, maintenance, helpdesk, engineering and logistics functions

5.0 DELIVERABLES

5.1 Products and Documentation:

5.1.1 Model Deliverables (Per Model)

Deliver Architecture Description Document and Model Design Plan for Government approval before conducting design. Model and all documentation, as laid out in Section 4. The contractor shall document all work and provide it in digitally discoverable form to the Government. All documentation and software shall be classified as required and marked in accordance with Government standards. Unless explicitly stated by the Government, integration into ITASE and test results demonstrating accurate performance shall be part of each final model deliverable.

For both the TMAP model and ITASE-compatible version of the model, deliver:

- the source code for the model and real-time simulation environment wrapper
- the compiled versions of the models
- all necessary scripts, project solutions, make files, and documented settings required to export and/or compile the model
- all files, scripts, user interfaces, input files, and configuration files that a user or integrator needs to execute the model
- all test scripts and test files

5.1.2 Existing Software Analysis Task

The contractor shall document all work. All documentation shall be archived in fully-discoverable digital form as directed by the Government. Formats will ideally conform to the standard Microsoft Office suite of tools. If dictated by specific requirements, and approved in advance by the COR, deliverables may utilize non-standard tools. Documentation may include formal or informal reports as specified by the Government, and software code listings and documentation created in accordance with NGIC standards. All documentation shall be owned by, and retained by the Government. All documentation shall be classified as required and marked in accordance with Government standards.

6.0 QUALITY ASSURANCE AND ACCEPTANCE CRITERIA

The Government will establish and maintain a QASP for work accomplished under this task order. The QASP will be based under the following standards and acceptable quality levels:

Number	Standard	Acceptable Quality Level
6.1	Deliverables meet all design, function, and performance requirements specified in the task description and satisfy the requirements as documented in the formal requirements document.	<ul style="list-style-type: none">Any requirements deemed unachievable shall be negotiated with COR prior to completion of model design phase.100% of formal requirements shall be met at final product delivery.No more than 2 re-writes of any documentation due to contractor error.
6.2	Model deliverables run without error, properly reflect results as reported in the test plan and test report, and are fully documented	<ul style="list-style-type: none">100% of errors found in Quality Control/Test and prior shall be fixed prior to final delivery.Test documentation shall be adequate to enable repetition of all test routines and comparison to observed results.Both TMAP and real-time/ITASE models are delivered.
6.3	Existing Software Analysis Deliverables are Thorough, Technically Accurate, and Complete	<ul style="list-style-type: none">Document key processes and algorithms.Integrate into TMAP models and real-time environment, as applicable.Consider intended hardware and software architectures in reporting.Document any potential unintended effects or vulnerabilities.
6.4	Work Plan is complete and on time	<ul style="list-style-type: none">Shall be delivered by

		deadline and shall completely describe planned contractor execution.
6.5	Quality Control Plan addresses all tasks and pertinent technical requirements specified in the TO.	<ul style="list-style-type: none"> • QCP shall address 100% tasks and technical requirements. • Shall accommodate interim steps to evaluate progress and model maturity through the duration.
6.6	Monthly Status Reports are complete and on time	<ul style="list-style-type: none"> • Technical accomplishments for current-month, planned next-month and adherence to planned schedule shall be documented. Variance from schedule by 10% shall be immediately addressed with COR and plan for resolution established within 14 business days.
6.7	In Progress Reviews are conducted in accordance the schedule in the approved Work Plan.	<ul style="list-style-type: none"> • Meeting Action Items shall be provided within 5 business days of meeting conclusion. • Subject Matter Expert representation shall be present at all IPR's. • Documents for Government review should be provided 1 week before meeting.
6.8	Timeliness. Delivered/revised according to schedule established in the TO and agreed to in the Work Plan or as modified by the COR.	<ul style="list-style-type: none"> • 100% of deliverable shall achieve deadline. Remainder shall be no later than 5 business day delay. • No more than 2 re-submissions of any deliverable due to contractor error. • Final deliverables incorporating all comments/fixes shall be submitted within 14 days of TO completion.
6.9	Internal Quality Control. Extent to which Contractor identifies problems and/or deficiencies and self-corrects them.	<ul style="list-style-type: none"> • COR shall be notified of all major problems/deficiencies and resolution plan within 2 business days of issue discovery. • Quality and Reliability of delivered products shall

		meet 100% of the performance requirements established in the TO or as modified by the COR.
6.10	Simulation Support	<ul style="list-style-type: none"> • Ensure TMAP models are delivered in an additional real-time format that runs in ITASE. • Maintain functioning hardware and software for a real-time environment on-site at NGIC. • Create realistic battlefield simulations using developed models.

The monthly reports and In Progress Reviews (IPR) will be used to monitor contractor performance. As a means of measuring quality of workmanship, the Government will conduct a 100% inspection of the deliverables. Each deliverable specified in the individual TO will be inspected and assessed for quality and timeliness.

6.1 Problem Notification

The contractor shall submit a Problem Notification Report (PNR) to the NGIC COR, GSA COR, and GSA CO within 24 hours of the contractor encountering a problem or risk event that significantly impacts the cost, schedule, or performance of the Task Order (or any deliverable or project under the Task order). See below for a PNR template. All PNRs must be tracked in the monthly status report (MSR) and through in-progress reviews (IPRs) until the Government determines they are resolved.

Problem Notification Report (PNR)

1. Nature and sources of problem:
2. NGIC COR was verbally notified on: (date) _____
3. Is action required by the Government? Yes_____ No_____
4. If YES, describe Government action required and date required:
5. Will problem impact delivery schedule? Yes_____ No_____
6. If YES, identify what deliverables will be affected and extent of delay:
7. Can required delivery be brought back on schedule? Yes_____ No_____
8. Describe corrective action needed to resolve problems:
9. When will corrective action be completed?
10. Is increased cost to the Government anticipated? Yes_____ No_____
11. Is increased risk to Government users or customers anticipated? Yes_____ No_____
12. Did an information assurance violation or system security breach occur? Yes____ No_____

7.0 SECURITY

7.1 Security Program

The contractor shall maintain and administer a security program in accordance with the Industrial Security Manual DoD 5220.22M.

7.2 Security Clearance Necessity

Loss or suspension of required security clearance as set forth on the DD Form 254, "Contract Security Classification Specifications", would result in the contractor's inability to perform in accordance with the terms and conditions of this task order. As a result of this failure to perform, the contractor is subject to termination.

7.3 Removal for Other Security-Related Reasons

In the interest of national security, the Government reserves the right to remove any contractor employee who is either directly or indirectly involved in performance of this task order. This action shall be taken in circumstances where the Government believes that probable cause exists irrespective of whether or not a basis exists for removal of the contractor's or individual's security clearance. The Government also reserves the right to remove any contractor employee for the purpose of conducting an investigation of alleged misconduct that jeopardizes security of the project.

7.4 Military Security Requirements

Military security requirements in the performance of this task order shall be maintained in accordance with this PWS and the DD Form 254.

7.5 Required Clearances

Task Order performance requires a TOP SECRET (TS) facility clearance, TOP SECRET safeguarding, and staffing with key personnel cleared to the TOP SECRET//SPECIAL BACKGROUND INVESTIGATION//SECRET COMPARTMENTED INTELLIGENCE (TS//SBI//SCI), TOP SECRET, or SECRET level as tasking dictates. It is mandatory that the Program Manager be cleared to the TS/SBI/SCI level. NLT 15 days after task order award, individuals with SECRET clearances must begin work on this effort. NLT 30 days after task order award, individuals with TOP SECRET clearances shall be available for tasking. The contractor is responsible for obtaining all necessary security clearances for contractor personnel.

8.0 ADMINISTRATIVE CONSIDERATIONS

8.1 Government Points of Contact

GSA Contracting Officer
Angela Bennert
GSA FAS, Mid-Atlantic Region
100 S INDEPENDENCE MALL W
PHILADELPHIA PA 19106-2320
Office: 215-446-5818
Email : angela.bennert@gsa.gov

GSA Contract Specialist
Ryan Mathews

ITSS Order ID No.: ID03160019
GSA/FAS Mid-Atlantic Region

GSA FAS, Mid-Atlantic Region
100 S INDEPENDENCE MALL W
PHILADELPHIA PA 19106-2320
Office: (215) 446-5793
Email: ryan.mathews@gsa.gov

GSA Project Manager/Contracting Officer's Representatives (GSA COR)
Carol Carpenter
GSA FAS, Mid-Atlantic Region
100 S INDEPENDENCE MALL W
PHILADELPHIA PA 19106-2320
Office: (301) 737-2493
Email: carol.carpenter@gsa.gov

NGIC Contracting Officer's Representative (COR)
Bobby Rivers
Intelligence Specialist
Office - 434-980-7176
Email: bobby.j.river.civ@mail.mil

8.2 Period of Performance

Base Period:	August 5, 2016 to August 4, 2017
Option Year One:	August 5, 2017 to August 4, 2018
Option Year Two:	August 5, 2018 to August 4, 2019
Option Year Three:	August 5, 2019 to August 4, 2020
Option Year Four:	August 5, 2020 to August 4, 2021

8.3 Place of Performance

Primary locations of performance shall be at the NGIC and at the contractor's facility. The Government anticipates that approximately 30% or less of the work will need to be performed at the NGIC and 70% or more of work will be done at the contractor's facility. Top-level tasks that require technical coordination and interaction with NGIC personnel will be performed on-site at NGIC. Additionally, simulation tasks and support are carried out on-site at NGIC. Lower-level development and programming, as well as management of these efforts, can be accomplished at the contractor facility.

Specific research/investigation may require short-term activities at other Government facilities. Contractor shall be required to travel CONUS and OCONUS as needed, in accordance with Joint Federal Travel Regulations. When necessary due to tasking, personnel shall be required to report to the NGIC facility all or part of their work-day.

8.4 Local Integration and Development Space

In order to ensure consistent and frequent communication with NGIC technical personnel, the contractor shall provide a facility for critical contractor technical and programmatic leads, cleared for processing at no less than the SECRET level, within a reasonable commute distance (30 miles) of NGIC. Additional contractor personnel may be located at a more distant location, which shall be cleared for processing at no less than the SECRET level, but should be within the continental United States and within a 1 day travel radius of NGIC. Facilities meeting this requirement shall be certified at the SECRET level.

Contractor shall provide 2 shared seats of computing resources for Government employees who are collaborating on model development with the Contractor. Each seat shall include a Microsoft Windows computer adequately running the currently compatible version of Matlab and Simulink for model development. Additionally, the computer shall be connected to the network that the Contractor is using for model development and operation. These shall be located in the contractor office local to NGIC. This space will allow for enhanced integration of NGIC Government employee efforts into currently existing models. Hardware and software for Government personnel utilizing these shared seats will be reimbursed by the Government through the ODC CLIN (See PWS 8.7).

8.5 Work Hours

Contractor work hours shall be consistent with Government personnel duty hours, generally between 8:00 A.M. - 5:00 P.M., Monday through Friday, excluding Federal holidays, unless otherwise coordinated and approved by the NGIC PM.

8.6 Travel

Contractor shall be responsible for travel to and from the NGIC, Charlottesville location. Contractor may be required to attend work related off-site meetings to Huntsville, AL and or Dayton, OH. No more than three two-day trips for business-related meetings are anticipated per year. Contractor may also be required to travel OCONUS to the United Kingdom and Israel. Trips are estimated three 8-day trips for business-related meetings

All travel requires advanced approval of the COR. Travel costs shall be incurred and billed in accordance with FAR Part 31. Costs for these expenses will be reviewed, certified and approved by the COR. All travel and transportation shall utilize commercial sources and carriers. Contractor will be authorized travel expenses consistent with the substantive provisions of the Joint Travel Regulation (JTR) and the limitation of funds specified in this task order.

A Not-to-Exceed dollar value was established for Travel for each option period. All travel shall be coordinated in writing through the NGIC Client Representative and travel must be pre-approved by the GSA CO (or their designated representative) prior to incurring costs. The contractor shall provide appropriate supporting information (i.e. estimates) prior to the approval of reimbursable travel. The Contractor shall provide itemized travel costs with appropriate back up information to support travel authorizations and invoicing.

The Government will not reimburse the Contractor for local travel, defined as within 50 miles commute of the ordinary place of performance. Long distance travel will be reimbursed as outlined below.

The Contractor shall make every effort to travel as efficiently as possible. Air travel shall be accomplished on regularly scheduled commercial flights using the most economical manner consistent with the successful accomplishment of the work. Costs for lodging, meals, and incidental expenses may be based on per diem, actual expenses, or a combination thereof, provided the method used results in a reasonable charge (FAR Part 31.205-46). Travel costs shall be reimbursed to the Contractor only to the extent that it is necessary and authorized for performance of the services under this task order.

Reimbursement for the costs of subsistence and lodging shall be considered to be reasonable and allowable daily charges as compared to the maximum rates set forth in the following:

- Joint Travel Regulations Volume 2, DOD Civilian Personnel, Appendix A, prescribed by the Department of Defense for travel in Alaska, Hawaii, The Commonwealth of Puerto Rico, and the territories and possessions of the United States;

- Federal Travel Regulations prescribed by the General Services Administration for travel in the contiguous 48 United States;
- Standardized Regulations, (Government Civilians, Foreign Areas), Section 925, "Maximum Travel Per Diem Allowances in Foreign Areas" prescribed by the Department of State, for travel in areas not covered in (a) and (b) above.

Once travel is completed, a travel report confirming costs and travel shall be filed with the monthly status report and referenced when invoiced.

8.7 Non-travel Other Direct Costs (ODCs)

Non-travel other direct costs are anticipated to provide hardware and software for Government personnel utilizing shared seats at the Contractor's facility (see PWS 8.4). While the Government does not anticipate any additional other direct costs, ODC purchases may be needed to procure hardware, software, tools, licenses, maintenance, warranties, or other materials that are an ancillary and necessary to Services under the scope of this Task Order. Such Non-travel ODCs shall be integral and necessary to the overall Task Order performance. ODC requirements may be identified during performance by the Government or the Contractor. General-purpose items required for the conduct of the Contractor's normal business operations will not be considered allowable ODCs in the performance of work under this Task Order.

Since ODCs cannot be accurately forecast at this time, they are awarded on a NTE basis and may be partially funded as indicated on the award document.

The Not-to-Exceed dollar value established for Non-Travel ODCs is \$20,000.00 for the base and each option period.

All Non-travel ODC purchase requests must be routed through the NGIC POC for concurrence and shall be approved by the GSA Contracting Officer (or their designated representative) prior to incurring costs. The Contractor shall provide itemized data to support all ODC purchases with appropriate back up information as part of obtaining purchase approval from the Government.

Federal contracting laws and regulations apply to all Contractor open market purchases under this TO. Prices must be determined fair and reasonable from competitive sources and are subject to Government audit. The Contractor shall maintain records documenting competitive sourcing, in compliance with the competition requirements set forth in the Federal Acquisition Regulation (FAR). Upon request from the Government, the Contractor shall provide copies of such backup documentation, to verify that the Contractor complied with applicable competition requirements.

The Contractor shall be reimbursed for actual allowable costs plus the indirect handling rate. The Contractor shall only be allowed to apply indirect rates to ODC costs after award if such application is consistent with their successful price proposal and DCAA recommendations. No profit or fee will be allowed on ODCs. If no indirect handling rate is specified in the proposal, then no indirect rates will be applied or reimbursed on ODCs.

ODCs purchased under this Task Order shall become the property of the Federal Government. If the Contractor acquires hardware/software, maintenance, or licenses contractual rights to receive title shall be turned over to the Government upon completion of the Task Order.

8.8 Government Furnished Equipment/ Government Furnished Information

Government will provide software and hardware for work that is on-site at NGIC.

NGIC will provide the following:

- Software for existing software analysis task.
- Standard desktop workstations and software for contractor personnel located at Government facility (NGIC)
- Access to NGIC AJRAAC/ITASE facility.
- Outline of standard NGIC model documentation
- Classified descriptions of all systems to be modeled.

The contractor shall provide hardware and software for its employees off-site. Other than the hardware and software for Government personnel utilizing shared seats at the Contractor's facility (see PWS 8.4), no other equipment or COTS software or software licenses (e.g., MATLAB, Simulink, Real-Time Workshop licenses) will be furnished under this task order.

8.8.1 Limitations on the use or disclosure of Government-Furnished Information Developed by the Government

Technical data or computer software provided to the Contractor as Government-furnished information (GFI) under this task order may be subject to restrictions on use, modification, reproduction, release, performance, display, or further disclosure. The government developed software and owned software, known as "GHIDRA" is hereby provided to Dynetics as Government Provided Computer Software in performance of task order GSQ0316DS0045. This software is provided "as is," in accordance with contract clause FAR 52.245- 1, "Government Property." Should maintenance, updates, bug fixes be required, these will be performed by the Government and provided to the Contractor. The software may also be provided to Dynetics' subcontractors for use in the performance of task order #GSQ0316DS0045 after receiving permission from the Contracting Officer's Representative (COR). The software shall only be used on a system that has been accredited to process data classified at the appropriate level. The Contractor shall seek disposition instructions for the software from the COR at the completion of the task order.

The Contractor shall use technical data or computer software received from the Government for government purposes only. The Contractor shall not, without the express written permission of the Government, use, modify, reproduce, release, perform, or display such data or software for any commercial purpose or disclose such data or software to a person other than its subcontractors, who require the data or software to submit offers for, or perform, contracts under this task order. Prior to disclosing the data or software, the Contractor shall require the persons (e.g. employees and subcontractor employees) to whom disclosure will be made to complete and sign the non-disclosure agreement located in **Attachment A**.

The Contractor agrees to accept liabilities of an employee arising out of, or in any way related to, the misuse or unauthorized modification, reproduction, release, performance, display, or disclosure of technical data or computer software received from the Government with restrictive legends; and the Contractor shall ensure that its employees are subject to use and non-disclosure obligations consistent with this clause prior to the employees being provided access to or use of the Government provided software GHIDRA.

8.8.2 Nondisclosure of Information - See Attachment A

8.9 Technical Direction

Technical Direction must be within the scope of work described in the Performance Work Statement (PWS). The NGIC Client Representative and/or the GSA Contracting Officer's Representative do not have the authority to, and may not issue, any Technical Directions which:

- Constitutes an assignment of additional work outside of the PWS.

- Constitutes a change as defined in 52.243-1 CHANGES - FIXED-PRICE (AUG 1987)--ALTERNATE I (APR 1984) in any manner causes an increase or decrease in the total estimated contract cost, fixed-fee, or the time required for contract performance.
- Change any of the expressed terms, conditions, or specifications of the contract.

All Technical Direction shall be issued in writing by the GSA CO or the designated representative. The Contractor shall proceed promptly with the performance of Technical Direction duly issued by an authorized representative in the manner prescribed above.

If, in the opinion of the Contractor, any instruction or technical direction issued is within one of the categories as defined above, the Contractor shall not proceed but shall notify the GSA Contracting Officer in accordance with FAR 52.243-7 Notification of Changes (APR 1984).

8.10 Contractor Key Personnel

The Contractor Program Manager and Technical Leads on each new model shall be designated as Key Personnel. Replacement of Key Personnel shall have qualifications equal to or greater than the individuals quoted. Notification of proposed replacements shall be made by the contractor no later than 15 days prior to departure of the incumbent. The Government reserves the review qualifications of proposed replacements or substitutions of Key Personnel.

8.11 General Contractor Required Training

Contractors at Army facilities shall complete the training listed below within 30 days after the task order start date, and annually thereafter, unless otherwise noted. Contractors at other Government sites shall complete the Army training or similar training as required by the IPC supported. All contractor employees shall document training via an automated training certification tracking system provided by the Government. The contractor shall maintain, and make available to the COR certificates of completion for each affected contractor employee and subcontractor employee. The monthly status report shall include the status of individual contractor training (contract employee name, training title, last date completed, next due date). New hires shall complete all required training within 30 days of reporting to a Government facility and annually thereafter, unless otherwise noted. The contractor is responsible for ensuring all contractor employees have maintained their training.

- DoD Cyber Awareness Training
- Intelligence Oversight Awareness
- OPSEC Awareness
- Threat Awareness and Reporting Program (TARP)
- Classified marking Training (required once every two years).
- DNI Unauthorized Disclosures of Classified Information Training
- Annual Security Training - Army
- Sexual Harassment/Assault Response and Prevention (SHARP)
- DoD Controlled Unclassified Information (CUI) Awareness Training
- Anti-Terrorism Level One: All contractor employees, to include subcontractor employees, requiring access to Army installations, facilities and controlled access areas shall complete AT Level 1 awareness training within 30 calendar days after task order start date or effective date of incorporation of this requirement into the task order, whichever is applicable. The contractor shall submit certificates of completion for each affected contractor employee and subcontractor employee to the COR/ACOR or to the contracting officer, if a COR/ACOR is not assigned, within 15 calendar days after completion of training by all employees and subcontractor personnel. AT Level 1 awareness training is available at the following website: <https://atlevel1.dtic.mil/at>.

- iWATCH Training: The contractor and all associated sub-contractors shall brief all employees on the local iWATCH program (training standards provided by the requiring activity Authorization to Operate (ATO). This local developed training will be used to inform employees of the types of behavior to watch for and instruct employees to report suspicious activity to the COR/ACOR. This training shall be completed within 30 calendar days of task order award and within 30 calendar days of new employee's commencing performance. iWATCH training results shall be reported to the COR/ACOR not later than 45 calendar days after task order award.
- In-house, no cost, general/analyst and safety training determined applicable by the Program Manager/COR and approved by the Contracting Officer.

8.12 Invoicing

The Contractor shall submit Requests for Payments in accordance with the format contained in GSAM 552.232-70, INVOICE REQUIREMENTS (SEPT 1999), to be considered proper for payment. In addition, the data elements indicated below shall be included on each invoice.

Task Order number: *(from GSA Form 300, Block 2)*
Paying Number: *(ACT/DAC NO.) (From GSA Form 300, Block 4)*
Project No.
Project Title

The Contractor shall provide invoice backup data in accordance with the contract type, including detail such as labor categories, rates and quantities of labor hours per labor category.

Note: The Government reserves the right to audit, thus; the Contractor shall keep on file all backup support documentation for Travel, Tools, and ODCs.

8.12.1 Invoice Requirements

The Contractor shall submit a draft or advance copy of an invoice to the client POC for review prior to its submission to GSA.

The Contractor shall invoice monthly on the basis of cost incurred for the Labor, Base Fee, Travel, Tools, and ODC CLINs. The Period of Performance (POP) for each invoice *shall* be for one calendar month. The Contractor *shall* submit only one invoice per month. The appropriate GSA office will receive the invoice by the twenty-fifth calendar day of the month after the end of the invoiced month.

Content of Invoice: The Contractor's invoice shall be submitted monthly for work performed the prior month. The contractor may invoice only for the hours, travel, tools, and ODCs, ordered by GSA and actually used in direct support of the client representative's project. The invoice shall be submitted on official letterhead and shall include the following information at a minimum:

GSA Task Order Number
Task Order ACT Number
Remittance Address
Period of Performance for Billing Period
Point of Contact and Phone Number
Invoice Amount
Support Items listed by Specific Item and Amount (if applicable) billed to ODC or Tools CLIN as appropriate.
Training Itemized by Individual and Purpose (if applicable) billed to ODC CLIN

All hours and costs shall be reported by CLIN element and contractor employee, and shall be provided for the current billing month and in total from project inception to date. The contractor shall provide the invoice data in a Microsoft Excel spreadsheet format containing separate worksheets showing the information in a format agreed to by the Government. The invoice shall include the period of performance covered by the invoice and the CLIN numbers and titles. The Government reserves the right to modify invoicing requirements at its discretion. The Contractor shall comply with any revised invoicing requirements at no additional cost to the Government.

Interim close outs: The Government will close out each year of performance within 6 months of its expiration using the rates billed during that period. The contractor will be required to execute a waiver of claims to be included in a bi-lateral modification at the conclusion of the performance period.

Final Invoice: Invoices for the final performance period must be so identified and submitted within 6 months from completion. After this submission, no further charges are to be billed. A copy of the written client agency acceptance of task completion must be attached to the final invoice. If necessary, the contractor may request from GSA an extension for a final invoice that may exceed the 6-month time frame.

After the final invoice has been paid the contractor shall furnish a completed and signed Release of Claims (GSA Form 1142) to the Contracting Officer. This release of claims is due within fifteen (15) calendar days of final payment.

The Government reserves the right to require certification by a GSA COR before payment is processed, *if necessary*.

Credits:

If the credit invoice is for the same year of a particular ACT#, the contractor shall include that credit on a subsequent invoice submission against that same ACT#. If the contractor is unwilling to offset a subsequent invoice then they must submit a refund check.

When the credit invoice is for a different year, the contractor shall submit a refund check for that credit invoice.

Invoices that net to a credit balance **SHALL NOT** be accepted. Instead a refund check must be submitted by the contractor to GSA accordingly. The refund check shall cite the ACT Number and the period to which the credit pertains. The Contractor shall provide the credit invoice as backup documentation. Do not attach credit invoice in ITSS or on the Finance website. It must be attached to the refund check. The refund check shall be mailed to:

General Services Administration
Finance Division
P.O. Box 71365
Philadelphia, PA 19176-1365

FIRM FIXED PRICE (FFP) CLINS for LABOR (If applicable)

For FFP Labor CLINs, the Contractor shall invoice monthly on the basis of an equitable proportion of the fixed price costs allocable to the invoicing period. For example:

For FFP CLINs with a 12-month performance period, monthly invoices shall reflect 1/12th of the overall value of the FFP CLIN for the 12-month period.

For FFP CLINs with a performance period of less than 12-months in duration, monthly invoices shall reflect $1/n^{\text{th}}$ of the overall value of the FFP CLIN, where n = the total number of months in the performance period.

COST PLUS FIXED FEE (CPFF) CLINS for LABOR

The Contractor shall invoice monthly on the basis of cost incurred for the CPFF Labor CLINs. All hours and costs shall be reported by CLIN element and contractor employee, and shall be provided for the current billing month and in total from project inception to date. The Contractor shall provide the invoice data on separate worksheets in spreadsheet form with the following detailed information. The listing shall include separate columns and totals for the current invoice period and the project to date.

- a) Employee name (current and past employees)
- b) Employee company labor category
- c) Employee OASIS labor category and Associated Skill Level
- d) Actual Hours worked during the monthly billing period and total cumulative hours worked
- e) Billing rate

All cost presentations provided by the Contractor shall also include Overhead Charges, and General and Administrative Charges clearly shown both as a percentage and total dollars.

Fee: The Contractor's monthly invoice shall include the current and cumulative Fixed Fee.

TRAVEL

Costs incurred for Travel comparable with the FTR shall be invoiced monthly with travel itemized by Individual and Trip. The Contractor shall provide the Travel invoice data on separate worksheets in Microsoft Excel spreadsheet form with the following detailed information.

CLIN Total Travel: This invoice information shall identify all cumulative travel costs billed by CLIN. The current invoice period's travel detail shall include separate columns and totals and include the following:

- Travel Authorization Request Number or identifier
- Current invoice period
- Names of persons traveling
- Number of travel days
- Dates of travel
- Location of travel
- Number of days per diem charged
- Per diem rate used
- Total per diem charged
- Transportation costs
- Total charges

All cost presentations provided by the contractor shall include Overhead Charges and General and Administrative Charges. Fee shall not be permitted on travel costs.

TOOLS AND ODCs

Costs incurred for the Tools and ODC CLINs shall be invoiced monthly. The Contractor shall provide the Tools invoice data on separate worksheets in Microsoft Excel spreadsheet form with the following detailed information, as applicable:

- a) Tools purchased and/or ODC costs incurred

- b) Consent to Purchase Number or identifier
- c) Description of the Tools with the Quantity, Unit Price and Extended Price of each Tool and/or ODC identified
- d) Date accepted by the Government
- e) Associated CLINs
- f) Project to date totals by CLIN
- g) Cost incurred not billed
- h) Remaining balance of the associated CLINs

All cost presentations provided by the contractor shall also include Overhead Charges, General and Administrative Charges, and or material handling as appropriate and consistent with DCAA recommendations. Feel shall not be permitted on Tools and ODC costs.

INVOICE SUBMISSION PROCESS:

Invoice submission consists of:

- a) Create an Invoice Acceptance Document the GSA Assist portal's central Invoice Service (CIS), enter the service month, delivery data, invoice number, other pertinent comments and upload requisite backup documentation to obtain Client and GSA Acceptance.
- b) Click on the "Submit" button at the bottom of the page to complete the process.

Note: No paper copy of the invoice shall be submitted to GSA unless requested. The Contractor may be required to submit a written "hardcopy" invoice to the Government, or a hardcopy of the invoice with the client's certification if requested by the GSA COR.

When the Contractor's acceptance document is submitted, emails requesting Government acceptance are automatically sent to both the Client and the GSA Project Manager/COR. They will accept, partially accept, or reject the invoice, normally with explanatory comments and will indicate the amount approved for payment.

If the Contractor requires assistance or has questions regarding the acceptance and approval process, contact the GSA COR or call the ITSS Help Desk at the toll free number 1-877-243-2889. Be sure to have the ITSS Order number or ACT number available.

To check the payment status of an invoice, go to www.finance.gsa.gov. If you have payment questions, e-mail FW-PaymentSearch.finance@gsa.gov or call the Customer Support Desk at 1-817-978-2408.

8.13 Dissemination of Information

There shall be no dissemination or publication, except within and between the contractor and any subcontractors, of information developed under this task order or contained in the reports to be furnished pursuant to this task order without prior written approval of the Contracting Officer.

8.14 Organization Conflict of Interest

Performance under this task order may require the contractor to access data and information proprietary to a Government agency, another Government contractor or of such nature that its dissemination or use other than as specified in the work statement would be adverse to the interests of the Government or others. Neither the contractor, nor contractor personnel, shall divulge nor release data or information developed or obtained under performance of this work statement, except to authorized Government personnel or

upon written approval of the contracting officer. The contractor shall not use, disclose, or reproduce proprietary data that bears a restrictive legend, other than as specified in this work statement or any information at all regarding this agency.

Disclosure of Information regarding operations and services of the activity to persons not entitled to receive it and failure to safeguard any classified information that may come to the contractor (or any persons under the contractor's control) in connection with work under this work statement, may subject the contractor, contractor's agent, or employees to criminal liability under Title 18, sections 793 and 798 of the United States Code. Neither the contractor nor the contractor's employees shall disclose or cause to be disseminated, any information concerning the operations of the activity, which could result in, or increase the likelihood of, the possibility of a breach of the activity's security or interrupt the continuity of its operations.

The contractor shall direct to the contracting officer all inquiries, comments, or complaints arising from matters observed, experienced, or learned as a result of, or in connection with the performance of this task order, the resolution of which may require the dissemination of official information.

8.15 Government Shutdown Requirements for Essential Contractor Personnel—24/7 Contract Coverage

a. Government Closure. In the event that the US Government Office of Personnel Management (OPM) officially announces closure of the federal Government, and federal employees (other than emergency essential personnel) are not required to report to work, the Contractor shall follow this guidance:

(1) Personnel who, in accordance with the terms of the contract, perform their contractual duties on a Government installation or in a Government facility but have not been designated emergency essential personnel or are not fulfilling 24/7 requirements shall not report for duty under this contract and the contractor shall not invoice for those hours.

(2) Personnel who have been designated in writing by the Contracting Officer's Representative or verbally notified by the Contracting Officer (written confirmation will be provided within 2 business days) as emergency essential shall report to work.

(3) Personnel fulfilling 24/7 contract requirements (if any) who are not emergency essential but who are already at work may remain at work if approved by the Contracting Officer's Representative.

b. Installation Closure. The installation commander may, at his discretion, close the post, installation or facility even if the Government is otherwise open. In this case, (i.e., if the Government is open but the post, installation, or facility is closed), contractor personnel will not be able to report regardless of status. The Contractor shall not invoice for these hours. Unless a cognizant Government authority directs personnel to leave the installation, contractor personnel on site at the time of the closure may stay to complete their shifts at the discretion of the contractor manager taking into account safety and other issues. Contractors may bill for hours worked.

c. Announcements. The Contractor is responsible for monitoring announcements and informing employees of federal Government or installation closures.

d. Alternate Duty Sites. In the case of either Government closure or installation closure, the Contractor personnel whose place of duty is the installation or facility are not authorized to perform at an alternate duty site unless the Contracting Officer approves the type of work and the alternate location in writing in advance."

8.16 Proprietary Information

In the event that non-COTS, contractor-owned software is used in any task under this task order, the Contractor shall identify these software components to the Government and the Contractor shall grant unlimited use to the Government, in accordance with DFARS 252.227-7013 Rights in Technical Data.

All original software, engineering work, and other intellectual property developed or modified under this task order, including, but not limited to, models, model components, model subcomponents, and simulation tools, are owned by the federal Government.

8.17 Safety Plan

Contractor shall submit a copy of their safety plan to the COR. At a minimum, it must detail the formal internal/external plans and procedures for implementing, executing and ensuring continuing compliance of their safety program and applicable requirements, and plan of action in case of medical emergency. No medical services are available at the NGIC.

9.0 FAR / GSAM / DFARS CLAUSES

Reference paragraph I.1. TASK ORDER CLAUSES of the OASIS Basic Contract:

In accordance with FAR 52.301, Solicitation Provisions and Contract Clauses (Matrix), the OASIS master contracts cannot predetermine all the contract provisions/clauses for future individual task orders. However, all Applicable and Required provisions/clauses set forth in FAR 52.301 automatically flow down to all OASIS task orders, based on their specific contract type (e.g. cost, fixed price etc), statement of work, competition requirements, commercial or not commercial, and dollar value as of the date the task order solicitation is issued.

FAR Part 12 commercial clauses/provisions do not apply.

The following sections identify FAR / DFARS / GSAM or other additional and/or agency-specific provisions/clauses that are also applicable to this task order:

9.1 Incorporated by reference

- FAR 52.217-8 Option to Extend Services (NOV 1999)
- FAR 52.204-9 Personal Identity Verification of Contractor Personnel
- FAR 52.232-22 Limitation of Funds
- FAR 52-224-1 Privacy Act Notification & FAR 52.224-2 Privacy Act
- FAR 52.227-14 Rights in Data-General
- FAR 52.237-3 Continuity of Services
- FAR 52.239-1 Privacy or Security Safeguards (Aug. 1996)
- FAR 52.245-1 Government Property
- FAR 52.246-4 Inspection of Services-Fixed Price (Aug 1996)
- FAR 9.5 Organizational Conflict of Interest
- GSAM 252.209-7999 - REPRESENTATION BY CORPORATIONS REGARDING AN UNPAID DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW (DEVIATION 2012-O0004) (JAN 2012)
- DFARS 252.227-7013 Rights in Technical Data
- DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation.
- DFARS 252.227-7013 Rights in Technical Data--Noncommercial Items.
- DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation.
- DFARS 252.227-7015 Technical Data--Commercial Items.
- DFARS 252.227-7016 Rights in Bid or Proposal Information.

DFARS 252.227-7017 Identification and Assertion of Use, Release, or Disclosure Restrictions.
DFARS 252.227-7019 Validation of Asserted Restrictions--Computer Software.
DFARS 252.227-7025 Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends.
DAFRS 252.227-7027 Deferred Ordering of Technical Data or Computer Software.
DFARS 252.227-7028 Technical Data or Computer Software Previously Delivered to the Government.
DFARS 252.227-7030 Technical Data--Withholding of Payment.
DFARS 252.227-7037 Validation of Restrictive Markings on Technical Data.
FAR 52.227-01 Authorization and Consent.
FAR 52.227-02 Notice and Assistance Regarding Patent and Copyright Infringement.
FAR 52.227-06 Royalty Information.
FAR 52.227-09 Refund of Royalties.
FAR 52.232-39 Unenforceability of Unauthorized Obligations.
DoD 5000.59 DoD Modeling and Simulation (M&S) Management

9.2 Incorporated in full text

FAR 52.227-3 Patent Indemnity. (Apr 1984)

(a) The Contractor shall indemnify the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of the manufacture or delivery of supplies, the performance of services, or the construction, alteration, modification, or repair of real property (hereinafter referred to as "construction work") under this contract, or out of the use or disposal by or for the account of the Government of such supplies or construction work.

(b) This indemnity shall not apply unless the Contractor shall have been informed as soon as practicable by the Government of the suit or action alleging such infringement and shall have been given such opportunity as is afforded by applicable laws, rules, or regulations to participate in its defense. Further, this indemnity shall not apply to-

(1) An infringement resulting from compliance with specific written instructions of the Contracting Officer directing a change in the supplies to be delivered or in the materials or equipment to be used, or directing a manner of performance of the contract not normally used by the Contractor;

(2) An infringement resulting from addition to or change in supplies or components furnished or construction work performed that was made subsequent to delivery or performance; or

(3) A claimed infringement that is unreasonably settled without the consent of the Contractor, unless required by final decree of a court of competent jurisdiction.

(c) This patent indemnification shall cover the following items: This patent indemnification shall be applicable to any patent claims or suits against the Government arising out of any activity occurring pursuant to this contract regarding the making, use, or sale of any items, or materials; or the practicing of any processes; which, in either case, have been sold or offered for sale by the contractor or its subcontractors hereunder to the public, in the commercial open market, and to such items, materials, or processes with relatively minor modifications thereto.

FAR 52.217-9 Option to Extend the Term of the Contract (MAR 2000)

- (a) The Government may extend the term of this contract by written notice to the Contractor within 30 days provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 30 days before the contract expires. The preliminary notice does not commit the Government to an extension.
- (b) If the Government exercises this option, the extended contract shall be considered to include this option clause.
- (c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 66 months.

9.3 Contractor Manpower Reporting

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Defense Manpower Data Center (DMDC) via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address: <http://www.ecmra.mil/>

Reporting inputs will be for the labor executed during the period of performance during each Government fiscal year (FY), WHICH RUNS October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year, beginning with 2013. Contractors may direct questions to the help desk at: <http://www.ecmra.mil/>

Appendix A

Examples of Models

A. The Government provides the following models as examples of the variety of models which will be developed during the Base Period. These models are examples of the type of work that NGIC may require:

A.1 RF Sensor Model

A.1.1 RF Sensor Objective

The objective of this task is the planning, development, and optimization of a threat system high fidelity model, documentation, user interfaces, and functionally representative displays. The model shall be delivered in stand-alone desktop configuration and shall be architected/developed in a fashion which enable efficient integration into the Integrated Threat Analysis Simulation Environment. Full model functionality, documentation, and satisfactory test results shall be demonstrated for the Government representatives at the conclusion of the task. Demonstration of partial functionality, documentation, and satisfactory test results shall be demonstrated for the Government representatives as each portion of the model is completed.

A.2.2 Artillery Model Optimization Development Project

A.2.2.1 Artillery Model Task Objective

The objective of this task is the planning, development, and optimization of a single model which represents a variety of Artillery. This model will be leveraging previous DOD work. For projectile trajectories, the contractor shall directly use existing NGIC-owned model code with minimal enhancements. The model must also enable the analysts to easily/accurately predict the performance of solid fuel propulsion, based on commonly available intelligence. Additionally, the model shall realistically capture the speed, altitude, and weather-induced effects on aerodynamics and propulsion. This shall allow the accurate prediction of system impacts in realistic battlefield engagements. The model shall be delivered in stand-alone desktop configuration and shall be architected/developed in a fashion which enable efficient integration into the Integrated Threat Analysis Simulation Environment. Full model functionality, documentation, and satisfactory test results shall be demonstrated for the Government representatives at the conclusion of the task. Demonstration of partial functionality, documentation, and satisfactory test results shall be demonstrated for the Government representatives as each portion of the model is completed. The model shall be integrated into the ITASE simulation environment and have all required interfaces and process to enable interfacing with battlefield C4 and decision making.

A.2.3 Ground Mobility Model

A.2.3.1 Ground Mobility Model Objective.

The objective of this task is the planning, development, and optimization of a parameter driven, time-based physics model of a ground mobility vehicle. Parameters include drag and thrust profiles, engine performance characteristics, environment-driven traction profiles, and realistic decision-based autopilot. Additionally, vehicle-based weapons systems and the associated sensor packages shall be integrated with this mobile platform. The model shall be integrated into the ITASE simulation

environment and have all required interfaces and processes to enable interfacing with battlefield C4 and decision making.

A.2.4 C4 System Model

A2.4.1 C4 System Model Objective.

The objective of this task is the planning, development, and optimization of a model which represents a variety of radiofrequency communications devices. Reflected attributes should be frequency ranges, bandwidths, link closure, data rates, power levels, waveforms, and spread spectrum capabilities. The model should react to adverse conditions, and should have a consequent degradation in ability to close link and maximum data rate based on scenario. The model should take environmental, link budget, antenna considerations, and system orientation into account in determining a jammer to signal ratio. The model shall be integrated into the ITASE simulation environment and have all required interfaces and process to enable this critical component of battlefield C4 and decision making. A key capability will be the linking of many of these discreet C4 models into a reactive system-of-systems.

A.2.5 Software Effects Model

A2.5.1 Software Effects Model Objective.

The objective of this task is the planning, development, and optimization of a model which represents a variety of software effects. This model should characterize a variety of technologically complex software failure modes and analyze their impacts on an overall system or system of systems.

A.2.6 Rotary Wing Model Development

A2.6.1 Rotary Wing Model Development Objective.

The objective of this task is the planning, development, and optimization of a parameter-driven, interactive, time-based physics model of rotary-wing aircraft. Parameters include airfoil cross-section, drag and thrust profiles, engine performance characteristics, and basic autopilot. There may be efforts to integrate weapons and sensors into the rotary wing model. The model shall be integrated into the ITASE simulation environment and have all required interfaces and process to enable this critical component of battlefield C4 and decision making.

A.2.7 Ground Vehicle RF/IR Signature Model

A.2.7.1 Ground Vehicle RF/IR Signature Model Objective.

The objective of this task is the planning, development, and optimization of a model which represents a variety of RF and IR signatures. The model should be able to take an existing RF or IR signature of a ground vehicle as an input, and should be able to analyze a sensor system's ability to analyze and identify the signature in a variety of orientations. The model should additionally account for environmental conditions. The model shall be integrated into the ITASE simulation environment and have all required interfaces and process to enable this critical component of battlefield C4 and decision making.

A.2.9 Research, Analysis, and Software Prototyping of Cutting-Edge Technology

A.2.9.1 Research, Analysis, and Software Prototyping of Cutting-Edge Technology.

The objective of this task is to perform research, analysis, and software prototyping of cutting edge systems, such as sensors and weapons systems.

A.2.10 Existing Software Analysis

A.2.10.1 Existing Software Analysis.

The objective of this task is to analyze existing Government-supplied software of various code-languages and architectures, with limited documentation. Contractor shall develop documentation and modify the software for future use in models.